NRC-EPA Memo on Siting Guidelines for LLMW

This memo was published with NRC-EPA's Siting Guidelines for LLMW disposal sites. It was signed by J. Winston Porter, EPA Assistant Administrator for Solid Waste and Emergency Response, and Hugh L. Thompson, Jr., NRC Director for Nuclear Material and Safeguards on March 13, 1987.

TO: The States and Compact Regions
SUBJECT: Combined NRC-EPA Siting Guidelines for Disposal of Mixed Low-Level Radioactive and Hazardous Waste

As you are aware, the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) established milestones (and penalties for not meeting these milestones) to ensure adequate development of future disposal capacity for commercial low-level radioactive waste (LLW). The penalties are quite severe and the deadlines do not leave much room for slippage.

We would like to call to your attention the January 1, 1988 milestone (Section 5(e)(I)(B)) which requires that each non-sited compact or non-member state develop a siting plan for a LLW disposal facility. These siting plans must include detailed procedures and a schedule for establishing a disposal facility location and preparing a license application. Among other things, Section 5(e)(1)(B)(ill) provides that the siting plan shall:

"... identify, to the extent practicable, the process for (I) screening for broad siting areas; (2) identifying and evaluating specific candidate sites; art (3) characterizing the preferred site(s), ..."

This letter serves four purposes:

(1) to inform states and Compacts that, under current Federal law, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Environmental Protection Agency (EPA) have dual jurisdiction over mixed low-level radioactive and hazardous waste (Mixed LLW); (2) to state that both NRC and EPA do not consider the absence of EPA's final comprehensive location standards to be justification for states and compacts to not meet their obligations under the LLRWPAA; (3) to convey that both NRC and EPA are committed to providing guidance to states and compacts who request help in their efforts to meet the January 1988 LLRWPAA milestone for siting plans; and (4) to jointly transmit the NRC-EPA combined siting guidelines for Mixed LLW (enclosed).

Dual statutory authority exists for Mixed LLW, which is regulated by the NRC under the Atomic Energy Act (AEA), as amended, and by EPA under the Resource Conservation and Recovery Act (RCRA), as amended. Mixed LLW is defined as waste that satisfies the definition of LLW in the LLRWPAA and contains hazardous waste that either is listed in 40 CFR Part 261 Subpart D or causes the LLW to exhibit any of the hazardous waste characteristics identified in 40 CFR Part 261

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Subpart C. Both the NRC and EPA staffs consider that Mixed LLW can be disposed of in accordance with the above statutes and NRC and EPA regulations.

In 1982, the NRC promulgated regulations containing minimum site suitability requirements for LLW land disposal facilities under 10 CFR Part 61. In 1981, EPA promulgated minimum location standards for hazardous waste treatment, storage, and disposal facilities in 40 CFR Part 264. Section 3004(o)(7) of RCRA, which was added by the hazardous and Solid Waste Amendments of 1984 (HSWA), requires EPA to publish guidance dandifying areas of vulnerable hydrogeology; this guidance was completed and issued in July 1986. Section 3004(o)(7) of RCRA also requires EPA to specify criteria for the acceptable location of new and existing hazardous waste treatment, storage, and disposal facilities as necessary to protect human health and the environment. EPA anticipates proposing these location standards in September 1987 and promulgating them by September 1988. This schedule provides affected states and compacts with a preview of the final standards and an opportunity to comment on the standards before promulgation.

Because of uncertainty about the precise content of EPA's future location standards, states and compacts may have questions regarding the site selection process. Both NRC and EPA are committed to providing guidance to states and compacts who request help in developing their siting plans by the January 1, 1988 deadline. Technical questions pertaining to siting a disposal facility for Mixed LLW should be submitted in writing to either the NRC or EPA contacts listed below, as appropriate.for questions about the LLRWPAA For questions relating to siting deadline or NRC's site EPA's location standards suitability requirements, contact:

Division of Waste Management
Mall Stop 623-SS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Office of Solid Waste
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, D.C. 20460-0001

In summary, if states and compacts observe the enclosed NRC-EPA combined siting guidelines and keep abreast of the developing EPA location standards, the absence of final RCRA location standards should not prevent states and compacts from meeting their obligations under the LLRWPAA.

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Combined NRC-EPA Siting Guidelines for Disposal of Commercial Mixed Low-Level Radioactive and Hazardous Wastes

The following NRC-EPA siting guidance for Low-Level Mixed Waste (LLMW) disposal was published on March 13, 1987. The following memo was also published with the LLMW disposal siting guidance.

Introduction

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) requires states and compacts to develop siting plans for low-level radioactive waste (LLW) disposal facilities by January I, 1988. These disposal facilities may receive commercial mixed low-level radioactive and hazardous waste (Mixed LLW), which is regulated by the U. S. Nuclear Regulatory Commission (NRC) under the Atomic Energy Act (AEA), as amended, and by the U. S. Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA), as amended. Mixed LLW is defined as waste that satisfies the definition of LLW in the LLRWPAA and contains hazardous waste that either is listed in Subpart D of 40 CFR Part 261 or causes the LLW to exhibit any of the hazardous waste characteristics identified in Subpart C of 40 CFR Part 261. To assist in applying that definition, NRC and EPA recently developed joint guidance entitled "Guidance on the Definition and Identification of Commercial Mixed Low-Level Radioactive and Hazardous waste and Answers to Anticipated Questions." NRC has promulgated LLW regulations and EPA has promulgated hazardous waste regulations that pertain to the siting requirements for disposal facilities for Mixed LLW. Because of uncertainty about the precise content of EPA's future location standards, states and compacts may have questions regarding the site selection process. This document provides combined NRC-EPA siting guidelines, to be used before EPA's new location standards are promulgated, to facilitate development of siting plans for disposal facilities that may receive Mixed LLW.

Section 5(e)(I)(B) of the LLRWPAA requires states and compacts to develop siting plans for LLW disposal facilities by January I, 1988. In addition to other information, these siting plans must identify, to the extent practicable, the process for (1) screening for broad siting areas, (2) dandifying and evaluating specific candidate sites, and (3) characterizing the preferred site(s). It is anticipated that this process will be based primarily on the site suitability requirements that apply to LLW disposal. If facilities also receive Mixed LLW, their siting requirements will reflect additional requirements that apply to disposal of hazardous waste as defined by RCRA.

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In 1982, NRC promulgated regulations which contain minimum site suitability requirements for LLW land disposal facilities in 10 CFR 61.50. EPA has also promulgated minimum location standards for hazardous waste treatment, storage, and Disposal facilities in 40 CFR 264.18. Considerations affecting siting are also found in 40 CFR 270.3, 270.14(b) and (c). Although both NRC and EPA have incorporated siting requirements in existing regulations for LLW and hazardous waste disposal, respectively, the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA require EPA to publish guidance identifying areas of vulnerable hydro geology. In July 1986, EPA published this guidance in "Criteria for Identifying Areas of Vulnerable hydro geology under the Resource Conservation and Recovery Act--Statutory Interpretative Guidance, July 1986, interim Final (P8-86-224953)." The 1984 HSWA also requires (in Section 3004(o)(7)) that EPA specify criteria for the acceptable location of new and existing hazardous waste treatment, storage, and disposal facilities. EPA anticipates proposing these location standards In September 1987 and promulgating them in final form by September 1988.

EPA's scheduled date for promulgating its final location standards is nine months after the LLRWPAA January 1, 1988, milestone for non-sited states and compacts to develop siting plans. Therefore, states and compacts may require some assistance In their efforts to develop siting plans for LLW disposal facilities that may receive Mixed LLW. The two agencies are issuing these combined guidelines to promote the development of siting plans by states and compacts. Both NRC and EPA consider that the absence of EPA's final comprehensive location, standards for hazardous waste disposal facilities is not an adequate basis for states and compacts to delay development of siting plans for LLW disposal.

States and compacts should proceed at this time to develop siting plans In accordance with the existing NRC and EPA requirements. The following combined NRC-EPA guidelines are provided for use by the states and compacts, and are based or existing NRC regulations in 10 CFR Part 61 and EPA regulations in 40 CFR Parts 264 and 270. As EPA continues its development of location standards, both agencies will strive to keep states and compacts informed about the status of the developing siting requirements.

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Combined NRC-EPA Siting Guidelines

Site suitability requirements for land disposal of LLW are provided in 10 CFR Section 61.50. These requirements constitute minimum technical requirements for geologic, hydrologic, and demographic characteristics of LLW disposal sites. Several of these requirements identify favorable site characteristics for near-surface disposal facilities for LLW. The majority of the site suitability requirements, however, identify potentially adverse site characteristics that must not be present at LLW disposal sites. The site suitability requirements In 10 CFR Part 61 are intendeded to function collectively with the requirements for facility design and operation, site closure, waste classification and segregation, waste form and packaging, and institutional controls to assure isolation of LLW for the duration of the radiological hazard. The NRC technical Position entitled Site Suitability, Selection, and Characterization" (NUREG-0902) provides detailed guidance on implementing the site suitability requirements in 10 CFR Part 61.

EPA has also promulgated certain minimum location standards for hazardous waste treatment, storage, and disposal facilities. These standards are provided in 40 CFR Section 264.18. As previously noted, the hazardous waste regulations also include other location considerations as well as applicable provisions cf other Federal statutes For example, Subpart F of 40 CFR Part 264 requires establishment of ground-water monitoring programs capable of detecting contamination from land disposal units. While not a siting criterion per se, this requirement can preclude siting in locations that cannot be adequately monitored or characterized. A further description of location-related standards and applicable provisions of other Federal statutes can be found in the "Permit Writers" Guidance Manual for Hazardous Waste- Land Storage and Disposal Facilities: Phase I Criteria for Location Acceptability and Existing Applicable Regulations" (Final Draft - February 1985) This guidance manual describes five criteria for determining location acceptability ability to characterize, exclusion of high hazard and unstable terrain ability to monitor, exclusion of protected lands, and identification of areas of vulnerable hydrogeology. The first four of these criteria have a basis in the regulations and are fully described in the manual. The fifth criterion, vulnerable hydrogeology, is defined in the RCRA interpretive guidance manual mentioned above (Criteria for Identifying Areas of Vulnerable Hydrogeology under the Resource Conservation and Recovery Act--Statutory Interpretive Guidance, July 1986, Interim Final (PB-86-224953)

However, since HSWA also added other requirements in addition to location standards to prevent or mitigate ground-water contamination, EPA recognizes that vulnerable hydrogeology must be considered in conjunction with design and operating practices. Vulnerability should not be the sole determining factor in RCRA siting decisions. Rather, this criterion provides a trigger for more detailed evaluation of sites that are Identified as having potentially vulnerable hydrogeology. The extent of necessary site review and evaluation is related directly to the extent to which a location "fails" or "passes" the vulnerability criterion. Sites that are determined to be extremely vulnerable will require much closer examination than sites that are deemed non-vulnerable. The results of this more detailed review may then provide a basis for eventual permit conditions or modifications in, design or operating practices.

By combining the above technical requirements, standards and guidance of both agencies, NRC and EPA have formulated the eleven guidelines listed below. The use of terms in the guidelines is consistent with their regulatory definitions in 10 CFR Part 61 and 40 CFR Parts 260 and 264. The combined set of location guidelines is intended by the agencies to apply only as guidance to states and compacts developing siting plans for LLW disposal facilities that may receive Mixed LLW. These combined guidelines are not intended to displace existing standards and guidance. In addition, the independent guidance of both agencies should be considered in any application of the combined siting guidelines.

The combined siting guidelines for a commercial Mixed LLW disposal facility are as follows:

1. Primary emphasis in disposal site suitability should be given to isolation of wastes and to disposal site features that ensure that the long-term performance objectives of 10 CFR Part 61, Subpart C are met.
2. The disposal site shall be capable of being characterized,

modeled, analyzed, and monitored. At a minimum, site characterization must be able to (a) delineate ground-water flow paths, (b) estimate ground-water flow velocities, and © determine geotechnical properties sufficiently to support facility design. At a minimum for site ground-water monitoring, disposal site operators must be able to (a) assess the rate and direction of ground-water flow in the uppermost aquifer, (b) determine background ground-water quality, and © promptly detect ground-water contamination.

3. The disposal site must be generally well-drained (with respect to surface water) and free of areas of flooding or frequent ponding.
4. The disposal site shall not be in the 100-year floodplain.
5. The site must be located so that upstream drainage areas are minimized to decrease the amount of runoff that could erode or inundate waste disposal units.
6. Disposal sites may not be located on lands specified in 10 CFR Section 61.50(a)(5), including wetlands (Clean Water Act) and coastal high hazard areas (Coastal Zone Management Act). Location of facilities on the following lands must be consistent with requirements of applicable Federal statutes: archeological and historic places (National Historic Places Act); endangered or threatened habitats (Endangered Species Act); national parks, monuments and scenic rivers (Wild and Scenic Rivers Act); wilderness areas (Wilderness Protection Acts; and wildlife refuges (National Wildlife Refuge System Administration Act).
7. The disposal site should provide a stable foundation for engineered containment structures.
8. Disposal sites must not be located in areas where:

   (a) tectonic processes such as faulting, folding, seismic activity, or vulcanism may occur with such frequency and extent to affect significantly the ability of the disposal facility to satisfy the performance objectives specified in Subpart C of 10 CFR Part 61, or may preclude defensible modeling and prediction of long-term impacts in particular, sites must be located more than 200 feet from a fault that has been active during the Holocene Epoch;

   (b) surface geologic processes such as mass wasting, erosion, slumping, landsliding, or weathering occur with such frequency and extent to affect significantly the ability of the disposal facility to meet the performance objectives in Subpart C of 10 CFR Part 61, or may preclude defensible modeling and predicting of long-term impacts;

   (c) natural resources exist that, if exploited, would result in failure to meet the performance objectives in Subpart C of 10 CFR Part 61;

   (d) projected population growth and future developments within the region or state where the facility is to be located are likely to affect the ability of the disposal facility to meet the performance objectives in Subpart C of 10 CFR Part 61; and

   (e) nearby facilities or activities could adversely impact the disposal facility's ability to satisfy the performance objectives in Subpart C of 10 CFR Part 61 or could significantly

9. The hydrogeologic unit beneath the site shall not discharge ground water to the land surface within the disposal site boundaries.

10. The water table must be sufficiently below the disposal facility to prevent ground water intrusion into the waste, with the exception outlined under 10 CFR Section 61.50(a)(7).

In general, areas with highly vulnerable hydrogeology deserve special attention in the siting process. Hydrogeology is considered vulnerable when ground-water travel time along any 100-foot flow path from the edge of the engineered containment structure is less than approximately 100 years (criteria for identifying Areas of Vulnerable Hydrogeology Under RCRA--Statutory Interpretive Guidance, July 1986, Interim Final (PB-86-224953). Disposal sites located in areas of vulnerable hydrogeology may require extensive, site-specific investigations which could lead to and provide bases for restrictions or modifications to design or operating practices. however, a finding that a site is located in an area of vulnerable hydrogeology alone, based on the EPA criteria, is not considered sufficient to prohibit siting under RCRA.

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